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Project Proposal

Ecological Monitoring of Tiger Population in Panna Landscape, Madhya Pradesh

Under the major project

'Reinforcement of Tiger Population in Panna Tiger Reserve'

Background

Panna Tiger Reserve in Madhya Pradesh faces serious conservation challenges, largely as a consequence of rapid decline of tiger population in the last few years. In response, the State Forest Department proposed to reinforce tiger population by translocating tigers from other parts of the State. After much deliberation, a decision was made in February 2009 to translocate two tigresses immediately from other suitable areas, and it was desired that the strategy should include technical expertise from Wildlife Institute of India (WII). Accordingly, WII instituted a technical team consisting of Mr. Qamar Qureshi and Mr. Subhranjan Sen for assisting in translocation process, and Dr. K. Ramesh for monitoring the translocated tigers. As per the plan, a tigress from Bandhavgarh Tiger Reserve, and another from Kanha Tiger Reserve were brought to Panna Tiger Reserve by road and by IAF helicopter respectively on 04 March 2009 and 09 March 2009. After a few days of observation in the ca. 1 ha carnivore proof enclosure, these tigresses were released into wild. These are being monitored by radio-tracking devices (VHF and GPS Collars) that were attached to the animals after capturing in their native places. After a period of initial lull, both the individuals explored the area rapidly, made kills and appear to have settled down in the new home in Panna Tiger Reserve. WII continues to provide technical assistance, and researchers were involved in monitoring these tigresses along with field staff, until June 2009, when the original project committed by WII came to an end.

It has now become clear that more tigers need to be brought in to reinforce the tiger populations in Panna TR, and that undertaking ecological monitoring of these individuals is extremely critical as outline by the Translocation Protocol recently developed by National Tiger Conservation Agency (NTCA). In addition to generating details of movement pattern, and providing enhanced protection measures to these individuals, radio-tracking tigers here will certainly provide much greater insights on the

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tiger biology relevant for resolving challenging issues, and for ensuring tiger conservation in the long term. Therefore, in line with the original proposal put forth by the State Forest Department to NTCA, where there is a specific role for WII, this project proposal is submitted for allocating required resources for institutionalizing the activities, including recruiting of dedicated researchers. The proposed project envisages that monitoring of tigers in Panna Tiger Reserve should target providing finer details on the home range and movement pattern, predator co-occurrence variations, prey-predator relationship and disturbance factors.

The huge efforts placed on the re-building exercise is likely to generate much more than the movement and home range information, and clearly, it is one of the rare opportunities for understanding several facets of tiger conservation biology, testing traditional and modern methods including estimating low-density population, sensitivity of estimates to population recruitments, and tiger response to local and landscape variables. All these would be critical for developing tiger conservation plan in the long-term. While the information is obtained regularly by the monitoring team and mapped in GIS appropriately, the linkages with various factors need to be understood. As a follow up, the proposed project in addition to monitoring the radio-collared individuals, would aim to understand the prey-predator relationship, landscape ecology of tiger, and population estimation protocol for tiger and associated species. The project would also delve into exploring the reasons for tigers staying out of PTR, occupying wide range encompassing area adjoining PTR. Such an investigation was recommended in the recently concluded high level meeting chaired by the Secretary (E & F), Govt. of India.

Design and Methods

The radio collared tigers would be monitored by triangulation and by home-in methods using VHF device, and also by direct download from satellite off the satellite collars in the Argos Satellite Platform. Data collection would be carried out round the clock in the initial period until the tigers settled down in the area, and there after, a sampling strategy targeting data collection at regular interval would be developed. Given the limited number of VHF receiver equipments and trained man power, data collection will be done at regular intervals, with specific days for triangulation and home-in, which will be done both round the clock, and at regular intervals (e.g. every three days). The locations would be plotted on GIS map, and estimates would be derived based on home range analysis in Animal Movement Extension in ArcView Software. Grid based sampling would be done for analyzing movement pattern and for estimating population status of predators and prey species. A hierarchical analysis would be done to establish the linkage with the observed radio locations and various factors that influence tiger

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movement and conservation status. Camera trap would also be done simultaneously to understand the variation associated with low density population estimates of tiger and to estimate population sizes of co-predators on spatio-temporal scale, towards gaining insight on the responses shown by individual species with increasing tiger numbers and movement. The sensitivity of population estimate would also be understood, with variation in the number and movement of target species in the camera locations. Extensive surveys would be carried out in and outside Panna Tiger Reserve, and prey status in other areas would be evaluated to explore the reasons for the tigers moving out of the areas, besides other linked factors. Several thematic layers in GIS would be used to study the landscape ecology of tiger in Panna Tiger Reserve, also taking the surrounding matrix into consideration. The study would also target certain human-wildlife interface issues relevant for planning tiger conservation strategies for the Reserve in particular, and the tiger landscapes in general.

The following is the specific components proposed to be included in the study;

A: Monitoring of radio-collared tigers, by Satellite and VHF Collars.

B: Understanding the population response of co-predator by camera trap method.

C: Prey population dynamics, including group size variation by transect method.

D: Landscape ecology of tiger by spatial pattern analysis.

E: Socio-economic analysis of people, and human-wildlife interface issues, by questionnaire and field observation.

F: Estimating occupancy pattern and ecological correlates in the surrounding matrix, by extensive survey outside PTR and by conventional and GIS based analysis.

However, each of the components would be taken up on priority basis, with monitoring of translocated tigers being the top priority, but other activities would be taken up simultaneously or subsequently, depending on the resource and time availability.

Expected Outcome

The project would provide a detailed analysis of the behavior and movement pattern of introduced tigers, and would identify the correlates of positive and negative sensitive areas. Home range estimates and territoriality would be mapped. Identification of local and landscape variables that determine tiger distribution would be done, including the key disturbance elements. Occupancy and abundance estimates for prey and predator, and co-occurrence pattern would be estimated. Socio-economic profile of people in and around the area, and issues related to livestock population and use of the area would be provided. The causative factors that may be responsible for tigers moving out of the area would be explored. Much of the information that would be generated would be pioneering in nature, since the translocation program offer a natural experiments and the components identified in the proposed project would form interesting addition to the conservation biology and management of tiger.

Duration of the Project

The entire project duration would be for **four years (with 3.5 years of field work)**, but the exact time scale would be determined appropriately after preliminary observations, and after analyzing the emerging needs. The following is the specific details of data collection strategy along time scale.

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2009	*Assessment of tiger status project*			*Extension*			*Extension & Recruiting Researchers*			Tracking Tigers Camera trapping		
2010	Tracking Tigers Prey Estimation Extensive Survey			Tracking Tigers Interface Study						Tracking Tigers Camera Trapping Extensive Survey		
2011	Tracking Tigers Prey Estimation Extensive Survey			Tracking Tigers Interface Study						Tracking Tigers Camera Trapping Extensive Survey		
2012	Tracking Tigers Prey Estimation Extensive Survey			Tracking Tigers Interface Study						Tracking Tigers Camera Trapping Extensive Survey		
2013	Tracking Tigers Camera Trapping Analysis			Analysis & Report Writing						*Developing Future Activity*		

Budget Requirement

S.No.	Details	Amount (in Rs)
1	Research Fellow: 3 @ 14,000/pm for 48 months	20,16,000
2.	Field Assistant: 4 @ 3,500/pm for 40 months	5,60,000
3.	Vehicle & Fuel @ 8,00,000/py for 3.5 years	28,00,000
4.	Travel for Project Personnel for 3.5 years	5,25,000
5.	Equipments	5,00,000
6.	Contingency @1,50,000/year for 3.5 years	5,25,000
7.	Miscellaneous (Report)/unforeseen	2,50,000
	Total	**71,76,000**

Justification: 2 Research Fellow + 2 Field Assistants for monitoring collared tigers

1 Research Fellow + 2 Field Assistants for other population estimation and survey in other parts of Panna Landscape.

2 vehicles have to be hired - one for tracking team and the other for other studies, including survey in the landscape.

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Budget requirement on yearly basis is given below;

	Item	BUDGET (in Rupees)				TOTAL
		1st Year	**2nd Year**	**3rd Year**	**4th Year**	
A.	Recurring					
	1.Salaries/wages	6,72,000	6,72,000	6,72,000	5,60,000	25,76,000
	2. Consumables	1,50,000	1,50,000	1,50,000	75,000	5,25,000
	3. Travel	9,50,000	9,50,000	9,50,000	4,75,000	33,25,000
	4. Other costs	1,00,000	50,000	50,000	50,000	2,50,000
B.	Equipment	4,00,000	1,00,000	-	-	5,00,000
	Grand total (A+B)	**20,72,000**	**17,22,000**	**16,22,000**	**10,60,000**	**71,76,000**

Team Members

The following faculty members of WII would undertake the project, with specific roles. In addition, the Field Director of Panna Tiger Reserve is co-opted to be a collaborator in this project.

S.No.	Name*	Role
1.	Dr. K. Ramesh	Investigator: responsible for overall project activity, including design, field data collection and reporting.
2.	Mr. Subhranjan Sen	Investigator: responsible for coordination, field data collection, human-wildlife interface issues and reporting.
3.	Dr. J.A. Johnson	Investigator: responsible for monitoring, field data collection, extensive survey and reporting.
4.	Field Director Panna Tiger Reserve	Collaborator: responsible for coordination, radio-tracking and logistics.

**Other suitable people will be involved as and when required, within the same resource allocation and time scale.*

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